

**REMARKS****Claim Rejections – 35 USC §112**

The Examiner rejected claims 4 and 5 under 35 USC §112 because he said the phrase "based on," as used in those claims, was indefinite. Applicant has amended the claims to address the Examiner's concerns.

**Claim Rejections – 35 USC §102**

The Examiner rejected claims 1, 2, 4, 5 and 7 under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,942,975 to Sorensen. Those rejections are traversed because Sorensen fails to disclose all the limitations of the claims.

Specifically, Sorensen does not disclose a contact detection system "adapted to distinguish contact between the cutter and the person from at least one other event generating a comparable amount of change in the at least one property," as recited in claim 1. Sorensen simply discloses a system to detect the distance between two objects by transmitting a signal from one of the objects to the other. If the signal is received with a sufficient intensity, then Sorensen will activate a protective operation. (Column 2, lines 40-48; column 5, lines 37-46; and Fig. 4.) For example, Sorensen says a chain saw can transmit a signal through the handle of the saw to a person holding the saw, and the person can then transmit the signal to the blade. The intensity of the signal received by the blade will depend on the distance between the person and the blade. If the system receives the signal with a given intensity, then a person is too close to the blade and a protective operation (such as interrupting power to the motor) will be activated. (Column 8, lines 40-65.) However, Sorensen will activate the protective operation whenever the signal is received with sufficient intensity, regardless of what object transmitted the

signal. In other words, Sorensen will activate a protective operation whether the signal is transmitted through a person to the blade of a chain saw or through a tree to the blade of a chain saw. That is why Sorensen says his system may unintentionally activate a protective operation when cutting a hedge (column 11, lines 30-43), when mechanically processing animals (column 12, lines 9-14), or when a front handle of a tool moves within a security distance (column 12, lines 33-36). Any of those objects may transmit the signal to the receiver and if so, the system will activate the protective operation. The system in Sorensen does not and cannot distinguish the objects that transmit the signal. Moreover, because Sorensen simply looks to see if a signal has been received with sufficient intensity, Sorensen does not distinguish contact between a person and the blade from some other event generating a comparable amount of change in at least one property of the signal. Thus, the system disclosed by Sorensen is different than the system recited in claim 1.

Additionally, the contact detection system in claim 1 is adapted to distinguish events "based on the time during which the change in the at least one property occurs," and Sorensen fails to disclose that limitation. As stated, Sorensen is concerned with simply receiving a signal, not with distinguishing events based on the time during which a change in at least one property of the signal occurs. This is another difference that distinguishes claim 1 from the system disclosed in Sorensen.

Claims 2, 4, 5 and 7 depend from claim 1 and distinguish Sorensen for the same reasons as claim 1. Claim 4 also distinguishes Sorensen by specifying that "the time during which the change in the at least one property occurs is less than one

millisecond." Claim 5 further distinguishes Sorensen by saying "time during which the change in the at least one property occurs is less than one hundred microseconds."

The Examiner supported the §102 rejection by saying that "Sorensen discloses the invention as claimed including ... a contact detection system 9 electrically coupled to the cutter to impart an electrical signal thereto." (Office Action, 4.) Number 9 in Sorensen, however, identifies "a control unit" that incorporates the receiver circuitry shown in Figure 2, that "controls the security system 10 in turn controlling the protective measures such as braking or power cut-off 11," and that "controls an alarm and self-testing circuitry 11a." (Column 9, lines 46-48 and 51-55.) Control unit 9 does not impart a signal to a blade.

The Examiner also cited column 12, lines 40-47 in the Sorensen patent as supporting the conclusion that Sorensen discloses a contact detection system "adapted to distinguish contact between the cutter and the person from at least one other event generating a comparable amount of change in the at least one property based on at least one change in the at least one property that occurs in less than one hundred microseconds." (Office Action, 5.) However, column 12, lines 40-47 does not disclose any such system. Instead, those lines say:

Certain problems arise from smaller variations in the security distance, for instance in chain-saws depending on whether the edge or the flat of the blade approaches the operator. These problems are minimized by embedding small metal portions isolated from the blade and connected with the receiver or the transmitter. Alternatively, further criteria are used to measure the distance – for instance a temporal factor.

Thus, the cited portion of Sorensen does not support the conclusion stated by the Examiner.

In light of these differences between claim 1 and Sorensen, applicant requests that the rejection based on 35 U.S.C. §102 be withdrawn.

**Claim Rejections – 35 USC §103**

The Examiner rejected claim 3 under 35 U.S.C. §103(a) as obvious in light of Sorensen. That rejection is traversed because Sorensen fails to teach or suggest all the limitations of claim 3, and obviousness cannot be established unless the cited references teach or suggest all the claim limitations. MPEP 2143.03. Claim 3 depends from claim 1 and distinguishes Sorensen for the same reasons as claim 1. Additionally, claim 3 says "the contact detection system is adapted to identify contact between a person and the cutter as a reduction in the voltage amplitude of the signal on the cutter of at least 5% within 100 microseconds." Sorensen fails to teach or suggest this limitation because Sorensen fails to distinguish contact between a person and a blade from some other event generating a comparable amount of change in at least one property of a signal. As stated above, Sorensen is concerned with receiving a signal, not with distinguishing human contact with a blade from other comparable events.

The Examiner, however, says, "It would have been obvious to one skilled in the art to detect a decrease in the signal on the cutter if the circuit were wired to create a decrease in the signal on the cutter of at least 5% within 100 microseconds rather than an increase so that less power would be used." But Sorensen gives no reason or motivation to modify his device to look for a signal that decreases in voltage amplitude by at least 5% within 100 microseconds. To the contrary, if the system in Sorensen was "wired" to look for a decrease in the signal, then the system would no longer detect when a person approached the blade because the approach would cause the signal to

increase, not decrease. Where is the suggestion to "wire the circuit" to create a decrease in the signal on the cutter? Additionally, why would a person of ordinary skill think to wire the circuit in Sorensen to look specifically for a 5% decrease over 100 microseconds? Where is the motivation or teaching to make those changes?

The Examiner also said changing the system in Sorensen would be obvious because "less power would be used." Applicant does not understand that statement. Does the Examiner mean that less power would be required to drive the receiver circuit shown in Figure 2 of Sorensen if the circuit was changed to look for a decrease? If so, why would less power be required, and where is the support for that conclusion?

The Examiner rejected claim 6 under 35 U.S.C. §103(a) as obvious in light of Sorensen combined with U.S. Patent No. 6,366,099 to Reddi. That rejection is also traversed because Sorensen fails to teach or suggest all the limitations of claim 6 and, as stated, obviousness cannot be established unless the cited references teach or suggest all the claim limitations. MPEP 2143.03.

Claim 6 depends from claim 1 and distinguishes the cited references for the same reasons as claim 1. Claim 6 further says "the at least one other event is contact between the cutter and green wood." Neither Sorensen nor Reddi teaches or suggests distinguishing contact between a cutter and a person from contact between the cutter and green wood, and neither reference says why that distinction is important. In fact, neither reference concerns itself with distinguishing contact at all. Nevertheless, the Examiner says, "it would have been obvious to one skilled in the art to set the sensitivity of the device of Sorensen to be able to distinguish between an event when green wood contacts the cutter from an event where a human touches the cutter in order to prevent

misfiring of the braking system." That statement, as far as it is understood, does not accurately describe Sorensen. In Sorensen, it is not contact between the blade and green wood that causes a misfire; a misfire occurs when the green wood transmits the signal to the receiver. If the signal is not transmitted through the green wood, then the green wood would not cause a misfire, regardless of the sensitivity setting. However, if the signal is transmitted through the green wood, a misfire will occur and the sensitivity setting will simply define how close the green wood must be to the receiver when the misfire occurs; the sensitivity setting will not affect whether there is a misfire.

The Examiner rejected claim 8 under 35 U.S.C. §103(a) as obvious in light of Sorensen combined with U.S. Patent No. 3,858,095 to Friemann. That rejection is traversed because Sorensen and Friemann fail to teach or suggest all the limitations of claim 8. MPEP 2143.03. Claim 8 depends from claim 1 and distinguishes the references for the same reasons as claim 1. Claim 8 further says "the reaction system is configured to stop movement of the cutter within 10 milliseconds after contact between the cutter and the person."

Friemann discloses a protective circuit for a band cutter. The circuit includes an oscillator with a voltage output connected to a bridge circuit. The bridge circuit is balanced until an operator touches the band cutter, at which time the bridge circuit becomes unbalanced and a voltage is transmitted to an amplifier circuit which, in turn, trips a relay to apply DC braking to the motor and to supply power to an electromechanical brake. (Friemann, column 3, line 35 to column 4, line 6.) Friemann states that its system will brake the motor "so that the band cutter stops in less than 1/100<sup>th</sup> second." (Friemann, column 4, lines 5-6.) However, it is not possible that the

band saw disclosed in Friemann could stop the blade within that time frame because Friemann must also stop the motor and pulleys in order to stop the blade, and all of those components have substantial mass and inertia. For example, assuming two pulleys (Figure 2 in Friemann actually shows four pulleys numbered 6, 7, 8 & 9) each having a mass of 2 kg and a radius of 20 cm, the torque required to stop the pulleys in 10 milliseconds would be approximately 250 N/M. That would require approximately a 15 hp motor. However, the armature of the motor also would have to be stopped, and the armature would most probably have inertia greater than the pulleys, thus increasing the required torque. In fact, a typical band saw motor would not even be able to stop itself in 10 milliseconds, let alone the pulleys. The electromagnetic brake would be of little more help. By way of example, a Stearns SM-250 electromagnetic clutch/brake that sells for almost \$1000, can provide only about 200 N/M of stopping torque, and that force could only be applied after actuation of the clutch/brake. Thus, even with the combination of the motor and an expensive electromagnetic brake, the system described in Friemann would not stop the blade in 10 milliseconds. Moreover, Friemann relies on switching of relays to control actuation of the brake and motor. (Friemann, column 3, lines 35-68.) However, relays normally take 5-15 milliseconds to operate, so it is questionable whether Friemann's electromagnetic brake or motor brake could even be engaged within 10 milliseconds. Accordingly, there is no reasonable expectation that the system disclosed in Friemann could be successfully combined with the system disclosed in Sorensen to arrive at a machine as described in claim 8. Without that reasonable expectation of success, a conclusion of obviousness is improper because the references should not be combined. MPEP §2143.02.

### **Obviousness-Type Double Patenting**

The Examiner provisionally rejected claim 1 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 18 of co-pending Application No. 10/292,607.<sup>1</sup> The Examiner said, "The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application. ...." Applicant disagrees with that rejection.

Claim 1 in the present application describes a woodworking machine with a contact detection system "adapted to distinguish contact between the cutter and the person from at least one other event generating a comparable amount of change in the at least one property ***based on the time*** during which the change in the at least one property occurs." (Emphasis added.) Claim 18 in the co-pending application, in contrast, recites a machine with "detection means for detecting contact between a person and a specified portion of the operative structure, and for distinguishing that contact from contact between at least one other material and the specified portion of the operative structure ***based on a frequency response*** of an electrical signal." (Emphasis added.) These limitations are different in that they distinguish contact between a cutter and a person from other events based on different factors, namely, time and frequency. Thus, the claims do not disclose or cover the same subject matter, so the double patenting rejection should be withdrawn.

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<sup>1</sup> The Examiner said claim 1 was provisionally rejected "under the judicially created doctrine of double patenting;" he did not expressly say the rejection was an obviousness-type double patenting rejection. However, as far as applicant is aware, the only judicially created doctrine of double patenting is obviousness-type double patenting. Therefore, applicant understands the Examiner's rejection as an obviousness-type double patenting rejection.

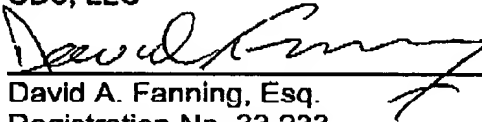


**CONCLUSION**

Sorensen fails to disclose all the limitations in claims 1, 2, 4, 5 and 7 and therefore Sorensen does not anticipate those claims. Additionally, Sorensen, Reddi and Friemann fail to disclose all the limitations of claims 3, 6, and 8, and therefore those references cannot establish those claims as obvious, as explained. Accordingly, applicant asserts that the pending claims are allowable, and applicant requests that the application proceed to issuance. Please call the undersigned with any questions.

Respectfully submitted.

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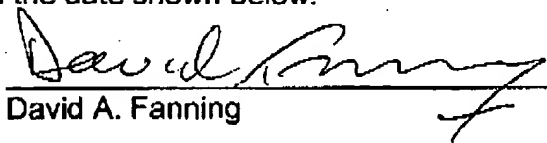
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Date: March 11, 2004

  
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